DOCUMENT RESUME

ED 273 177 HE 019 567

TITLE Winners of the Cost Reduction Incentive Awards, 1986.
INSTITUTION National Association of Coll. and Univ. Business Officers, Washington, D.C.; United States Steel Foundation, New York, N.Y.
PUB DATE 86
NOTE 48p.
AVAILABLE FROM National Association of College and University Business Officers, One Dupont Circle, Suite 500, Washington, DC 20036-1178.
PUB TYPE Guides - Non-Classroom Use (055)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Awards; Building Operation; Campus Planning; College Administration; *College Buildings; College Housing; Computer Oriented Programs; Computer Software; *Cost Effectiveness; *Educational Facilities Improvement; Efficiency; Energy Conservation; Equipment Maintenance; Higher Education; Incentives; *Operating Expenses; Program Costs; *School Maintenance; School Personnel
IDENTIFIERS Cost Reduction Incentive Awards Prog (NACUBO)

ABSTRACT

Sixty-five cost reduction efforts on college and university campuses are described, as part of the Cost Reduction Incentive Awards Program sponsored by the National Association of College and University Business Officers and the United States Steel Foundation. The incentive program is designed to stimulate cost-effective ideas and awareness of the use of financial, human, and natural resources on campus. While some aspects of a program may be unique to a particular institution, creative administrators may tailor the programs to their schools. Notable programs, some of which received prizes up to $10,000, include: the George Washington University alterations of student residence bathrooms using Corian sheet materials to overlay ceramic wall tiles; the North Carolina State University Public Domain Software Access Facility, which provides free access to software and which replaces most commercial software packages; the Canisius College voluntary program of using the resources of faculty aged 60 to 70 on a reduced basis; the Southern Illinois University, Carbondale, software trading post; the University of Alabama asbestos abatement laboratory; and the University of California, San Diego, implementation of an automated library photocopy reform. A list of all 1986 incentive program participants is included. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

NACUBO/USSF Cost Reduction Incentive Awards

The National Association of College and University Business Officers (NACUBO) and the United States Steel Foundation, Inc. (USSF) are proud to announce the winners of the eleventh annual Cost Reduction Incentive Awards Program and to publish these innovative ideas. Fifty-five institutions received monetary awards ranging from $10,000 to $100. Honorable mention awards went to eleven institutions.

The awards recognize outstanding cost reduction programs implemented during calendar year 1985. NACUBO and USSF recognize these as worthy ideas although they can offer no assurance that the ideas will function for others and in other situations.

The means of cost reduction presented in this booklet are saving money for the institutions named. While some aspects of a program may be unique to a particular institution, creative administrators are challenged to tailor the programs to meet special requirements of their institution.

NACUBO and USSF urge you to circulate this publication to persons on your campus who have responsibility in such areas as energy, financing, personnel, computer operations, and others mentioned herein. It is hoped that this booklet will encourage you in making efforts to reduce costs at your own institution.

Additional information may be obtained from NACUBO, ATTN: Information Exchange Coordinator, One Dupont Circle, Suite 500, Washington, D.C. 20036-1178; 202-861-2518.

Cost Reduction Incentive Awards Selection Committee

Thomas O. James, *chairperson*, Spring Hill College
John H. Anthony, Collin County Community College District
William A. Gregory, Jr., United States Steel Foundation, Inc.
Caspa L. Harris, Jr., Howard University
G. A. Hartford, Jr., Washington State University
Mary M. Lai, Long Island University
Roger D. Lowe, Wichita State University
Fred S. Vorsanger, University of Arkansas Foundation

NACUBO
One Dupont Circle, Suite 500
Washington, D.C. 20036-1178
Telephone: 202-861-2500

Student Residence Bathroom Alterations

The George Washington University

The George Washington University devised a method of repair using Dupont Corian sheet materials to completely overlay aging and deteriorated bathroom ceramic wall tiles, *which saves the university $120,000 annually.*

Having acquired for use as residence halls several large buildings previously used as hotels or apartment buildings, whose tiled bathroom walls had deteriorated badly because of water leaking down the walls and through the ceilings, the institution had to find a cost-effective technique to seal the water leaks and to restore the attractiveness of the bathrooms.

The institution used a method of repair that does not require the removal of walls but merely a simple overlay/wainscoting with Dupont Corian 1/4" sheets of Methyl Methacrylate capped with 3/4" x 1 1/2" Corian strips—from the floor to one inch above existing ceramic tile outside of tub and shower areas and fifty-seven inches above the tub. Where windows exist in tub areas, window stools of 3/4" Corian stock are inwardly sloped to drain shower water back into the tub. All corner and vertical panel joints are sealed by 1/4" x 1" Corian strips. Neoprene-based panel adhesive or Type I solvent-base spread adhesive was used to install sheet panels, and silicone sealants specifically recommended by Dupont were used to waterproof all joints.

This repair technique resulted in a cost-effective elimination of water leaks, no maintenance, and easy cleaning, as opposed to the university's alternative repair technique, which would have been the complete removal and reinstallation of ceramic tile, deemed more expensive, more disruptive, and more time-consuming.

The university calculated a cost differential, based on actually prototyping two bathroom repair examples: the cost to remove and replace the ceramic tile

($2,500) and the cost to install the Corian overlay ($2,000). The savings resulted in $500 per unit, with 240 units to be repaired. Other benefits from the Corian technique were reduced housekeeping costs and no painting. This method of repair has been so successful that other uses are being implemented, for example, in large athletic showers and in dog runs in animal research holding areas.

Public Domain Software and the Public Domain Software Facility

North Carolina State University

The North Carolina State University has placed in operation a multi-user Public Domain Software Access Facility to provide access to software that is free to any campus member to use. Choosing an alternative to purchasing expensive commercial software *saves the university more than $303,200 a year.*

Public Domain Software has been given by programmers for free use and can replace most commercial software packages. Applications of Public Domain Software range from word processors and spelling checkers to algorithms for solving complex science and engineering problems. Since it is free, it can be used without violating software licenses or the need of campuswide site licenses.

Another alternative to purchasing commercial software is Shareware or Freeware. This is software that an author encourages other people to copy and distribute in return for a requested monetary contribution, usually in the range of 25 to 200 dollars. The latest version of the software on disk is then sent, usually with bound documentation. The user is not bound in any way to pay for the software.

With the goal of the user never having to leave his/her office to acquire Public Domain Software or Freeware, available 24 hours a day on demand without need of Computing Center help, the North Carolina State University Computing Center created an access facility modelled after the Remote Bulletin Board Systems (RBBS), maintained by many microcomputer enthusiasts. Using an existing minicomputer, a DEC VAX 11/750 already in production use, over 800 disks of software for a variety of microcomputers were transferred to the disk storage of the minicomputer. Appropriate software was developed in-house to allow campus users with their existing data communications equipment and microcomputers to access this huge database and to transfer or "download" software from the facility to their own machines without Computing Center assistance.

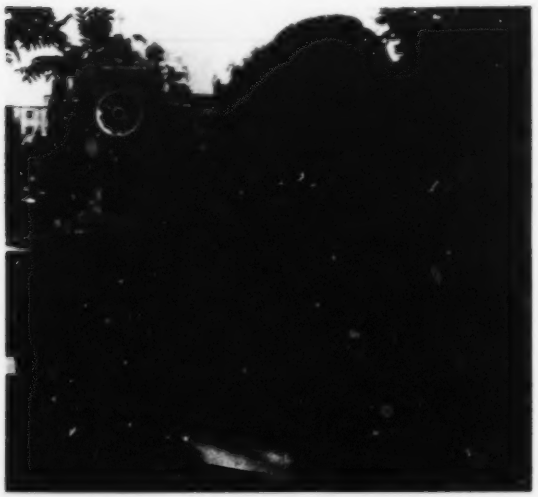
Faculty Resources Program

Canisius College

A voluntary program that uses resources of faculty aged 60 to 70 on a reduced basis has resulted in a *$62,500 savings for Canisius College*, has allowed for personnel flexibility, and has generated new hiring.

With 68 percent of the faculty tenured, and 28.5 percent in the 55-69 age category, older faculty at Canisius College had requested a program that allowed them to continue as part of the academic community, but with a reduced commitment to allow transition to other interests while maintaining involvement in academe. The college wished to respond to this request, as well as have some flexibility in dealing with personnel changes resulting from expected decreased or stable enrollment and varying concentrations of faculty. This led to development of the Faculty Resources Program.

The program was designed with the needs of the faculty as top priority, but it was soon realized that cost savings could accrue to the institution if the right mix of participation occurred, resulting from the four options provided by the program to allow for flexibility through a ten-year period, from ages 60 to 70 of the participants. Each participant must have 10 years of full-time service to apply. Inquiries about the program are made in confidence and only on the initiative of the interested faculty member. After entering the program, the faculty member is not permitted to return to full-time teaching.



Each faculty member must apply for admission to the program through his/her respective dean and be approved by the academic vice president. All fringe benefits continue throughout program participation. The program builds on both social security benefits and TIAA/CREF pension to which the employees and the college have contributed for so many years.

Mandatory retirement continues to be age 70 and each year participants in the program go through the normal annual faculty evaluation process and receive either the annual college raise or the increase in social security earnings maximum, depending on which program option they chose.

Software Trading Post

Southern Illinois University–Carbondale

The Southern Illinois University–Carbondale established a software trading post, a central "library" where original software that is no longer used by departments/units, together with accompanying documentation, is brought to its Microcomputer Technical Support Center within Computing Affairs to be donated or traded, *providing the university with an annual savings of $5,000.*

All software items involved are originals, not duplicates. They include packages, such as word processing, spreadsheets, graphics, data base, etc. University employees may review the software and determine function as it relates to specific applications that are to be automated.

The departments or units that bring software to the Center are those that have progressed to more sophisticated computing applications. They provide the software for use by university employees who are just beginning to computerize some functions, to test the software's applicability as well as its performance, and to share their experiences with other user groups.

Software acquired for trade is processed in a stipulated manner. A record is kept of pertinent information for reference purposes. Check-out forms are completed and signed by university employees. There is no investment required other than the time necessary for task force members (four) to work out details and procedures, and space to store software manuals and literature on shelves. A current list of software is maintained by the Technical Support Center in Computing Affairs.

The trading post has prevented unnecessary and inappropriate purchases of software by university units, and better purchases will result as people become familiar with the performance capabilities (through trial) of programs at the trading post. Computing Affairs envisions applying this idea to computing equipment and peripherals, and may include complete systems, terminals, printers, interfaces, modems, multi-function boards, and others.

In-House Asbestos Abatement Laboratory

The University of Alabama

Development of an in-house asbestos abatement laboratory *resulted in a yearly savings of $37,000 for the university*, and reduced the turn-around time on sample analysis from a ten-day average to 24 hours.

Rather than pay an independent laboratory $84,500 per year for air and bulk analysis in conjunction with its in-house asbestos abatement program, the university developed its own laboratory facility. An industrial hygienist and laboratory technician were hired and an in-house monitoring, sampling, and procedural laboratory was put into operation. The industrial hygienist has the final authority over procedure, monitoring, and sampling within the asbestos abatement program.

Development of the laboratory has led to a safer and healthier environment for faculty, staff, and

students, because information is now available immediately through the in-house laboratory. This prevents unnecessary on-site exposures of the university community to friable asbestos.

Initial start-up cost in addition to a laboratory operating cost (for salaries, material and supplies, and equipment depreciation) still came out some $37,000 less than a contract laboratory cost.

Implementation of an Automated Library Photocopy Reform

University of California, San Diego

The University of California, San Diego Library examined methods to improve its inadequate Photocopy Service program. Many self-operated methods as well as vendor-supplied programs were examined in order to accomplish the following goals: (1) To upgrade all existing photocopy equipment; (2) To improve copy quality and services to all library patrons; (3) To lower per-copy costs to library patrons; and (4) To automate existing interdepartmental recharge capabilities. The library successfully accomplished all these goals while *saving the university over $962,500* by sub-contracting the service to a photocopy vendor. Approximately $180,000 retained by cost avoidance will permit library staff to provide essential library services to its clientele.

The library committee, formed to explore various options for the provision of photocopy services, first considered an in-house operation, but found it too costly. A second option that became a solution was finding one copy vendor who could provide all the equipment needed, as well as service at a level the library required. By using a copy card, per copy costs were lowered. The vendor also supplied all new copier equipment, bill changers, card meters, and card generators, as well as new microfiche reader printers, thereby negating the need for a large outlay of library capital funds. Vendor-guaranteed routine scheduled maintenance of all equipment at each of the six library locations and provided staff for a fully staffed copy center in the Central Library to accommodate staff-mediated copying, card sales, and other copier services. Further, the vendor provided funds for the programming necessary for automation of its portion of the interdepartmental recharge program and included a plan for revenue sharing. The library then developed additional programming to allow on-campus patron billing and to permit the vendor to recharge programs to interface with existing university mainframes so that income can be recorded on official campus ledger documents.

The Power Reducer Installation

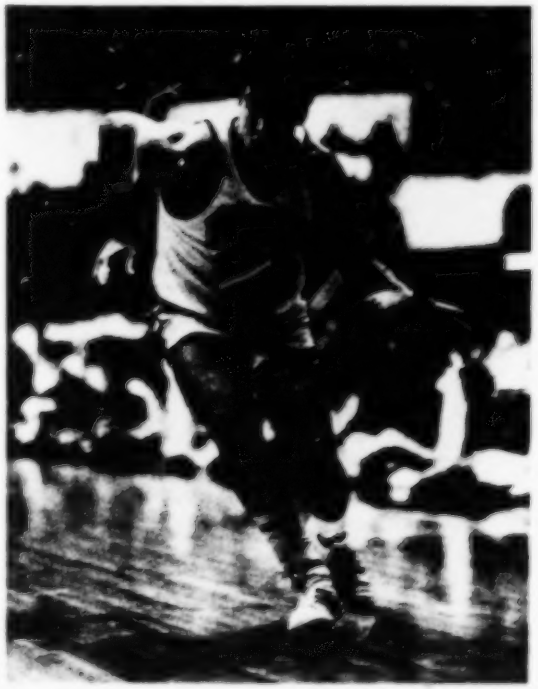
University of Chicago

The University of Chicago designed a power reducer, a small, solid-state device, to reduce power consumption in fluorescent lighting. The device reduced a typical double 40-watt fixture's 96-watt usage to 68 watts, effecting a 33 percent savings per fixture and *an annual savings of $217,600 to the institution.*

Despite the efficiency of fluorescent lighting devices over incandescent lamps, the fluorescent devices still waste a great deal of energy. The power reducer, about 1 1/2" x 1 3/4" x 4 1/2", with four wiring leads, when wired into existing twin fluorescent fixtures (40 watts each lamp), reduces power consumption by 1/3 with a nominal reduction in light output. If at the same time the fixture reflector and diffuser are cleaned, light levels ordinarily remain about the same, even increasing in cases where the fixture was quite soiled. This factor helps to reduce complaints about minimal reduced lighting levels.

The power reducer is warranted free of defects on a replacement basis for 70,000 hours of use, or 35 years for the university where average burn time is 2,000 hours per year. After installation the power factor remains well above 0.9, so the measured power reduction is a real one. Further, the surface temperature on the lamps is reduced, as well as the operating temperature of the ballast, resulting in a longer life (up to 20 percent) for these items.

Other procedures for lighting power reduction, such as economiser fixtures, Remtec, and low consumption lamps were considered, but found less cost-effective in all respects.



Advertising Fees and Equipment Secured for the Athletic Department

University of Virginia

Through competitive negotiation, the University of Virginia secured three- to five-year contracts with three major sporting goods manufacturers for the purpose of advertising and evaluating the firms' products by wearing the apparel in exchange for consulting fees and free equipment, *saving the university $161,000 annually.*

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

NACUBO

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

A widely accepted practice which poses problems is funding from sporting goods manufacturers of equipment and supplies, which usually is given to coaches of the respective sport, who in turn distribute the funds to the general athletic fund for the institution. Generally, promotional funds are closely monitored and money is properly distributed. To eliminate even the appearance of impropriety, the university decided to solicit proposals from all sporting goods manufacuturers interested in participating in a contractual agreement whereby the university's athletic teams would wear the apparel (which advertised the goods) and use the equipment of the manufacturers and comment on the goods' effectiveness. The manufacturers would in turn provide the athletic fund and individual teams with operational funds and free equipment. At the university, funds received are used for scholarships, equipment, and for paying part of the coaches' salaries. The monies and equipment received prior to the establishment of existing contracts were thought to be substantial, but as the solicitation and the final contract were established, the proceeds were much greater than anticipated.

Conventional procurement practices were used to select manufacturers and enter into legally binding contracts, which assure the institution a predetermined amount of funds and supplies for a specific period. A yearly poster advertisement, tournament and bowl tickets, and advertising spots on the message boards at home football and basketball games are provided to the manufacturer in exchange for advertising fees, equipment purchase fees, and actual equipment supplied.

An "Electronic Library" for an Off-Site Campus

DePaul University

To provide library services at the off-site campus near Chicago's O'Hare airport, the DePaul University Library developed an "electronic library," providing access to library materials and supplying books or journal articles only as needed by students and faculty. There is only one book—a dictionary—kept permanently at the O'Hare Campus. *The results are a yearly savings of $75,165 to the university.*

When the university expanded the physical facility and course offerings at its O'Hare Campus, a library committee considered ways to provide effective library service while coping with restrictions on the space available for books and materials and with existing demands on an already tight materials budget, and decided on an electronic library service. The service functions because of on-line access to the DePaul library collections and to the libraries of 26 other academic institutions in Illinois through an LCS (Library Computer System) terminal, which gives students and faculty at the O'Hare Campus ready information for finding materials by author and title.

Library materials can be sent directly or by telefacsimile and the library service can be staffed by part-time librarians under the direction of a full-time librarian based at one of the other campuses. Costs of establishing and maintaining a third collection and of paying extra library personnel were avoided, but not at the expense of O'Hare students and faculty.

Addition of an "Igloo" in Firebox of a Water-Tube Boiler

Loyola Marymount University

In order to increase the heat transfer in its water-tube boilers, Loyola Marymount University built a firebrick "igloo" into each firebox. The structure extended from the south end of the firebox for about 65 percent of the firebox length. With the burners at the south end, an opening at the north end, and vents in the "roof," stack temperature was reduced 260 degrees F., *resulting in a yearly savings of $25,000 for the university.*

The water-tube boilers burn natural gas to heat water which is then circulated throughout the campus to provide for space heating and domestic hot water. The "igloo" is more nearly like the rounded-roof entrance tunnel to the main part of an igloo. This particular structural arrangement distributes the flame throughout the length of the water-tubes, increases heat transfer, and thereby lowers the stack temperature.

Modifications of the two boilers which were carried out at the same time that some repair work was done on them, cost $15,000, whereas the alternative—the addition of a feed-water preheater mounted in the exhaust stack—would have been $60,000.

Student Management Employment Program

Syracuse University

Development of a student management program, which is managed by students for student employees and advised and supervised by professional management staff, *saves Syracuse University $309,280 annually.* Faced with too little time to hire, train, and develop a well-prepared student staff for the opening of the university's new student center, the institution implemented a student management approach. A student coordinator was selected, who worked a forty-hour week throughout the summer months to prepare for the opening, selecting and

interviewing a student management staff.

The student management team was able to develop training modules specific to the needs of the facility, and it developed unit manuals for training, operation procedures, and policies, including discipline, managerial, and leadership skills. The team continues to create sessions for training and development throughout the year, using professional staff as well as alumni and outside resources, and it is also responsible for the hiring process, discipline, and personnel and payroll management. It also prepares financial reports and analysis of labor cost in relation to the budget, projected departmental budgets, revenue, and costs. The student management program enables students to strengthen time-management skills and organizational, analytical, functional, interpersonal, and managerial and leadership skills, while implementing what they have learned in academe. They are additional arms and eyes for the professional management team.

Brine Tank Installation

Texas Tech University

Texas Tech University converted its water softener systems—six sodium ion exchange softeners—from rock salt regeneration to saturated liquid brine regeneration, resulting in a significant reduction in softener operating expense and the elimination of numerous employee injuries inherent in handling 80 pound salt bags. The conversion has yielded an annual *savings of over $6,900 for the university.*

System conversion required a local source of brine at a cost competitive with rock salt and the installation of brine-holding tanks at each of the eight softening stations. A source of brine, at a delivered cost about 14 percent less than rock salt, was identified, and tanks of sufficient size to limit brine delivery frequency and permit purchasing in quantity were installed.

Approximately 1,000 work hours annually expended handling rock salt has been completely eliminated by the brine vendor delivering directly to the holding tanks at each softener station, in contrast to the inefficient method used beforehand to deliver 1,600 80 lb. bags of rock salt annually. The difference in the cost of brine versus rock salt amounts to a savings of about $1,500 per year. The converted systems also require less maintenance than the old ones, thus generating an additional avoidance of about 50 work-hours per year, not to mention the time saved because of the elimination of accidents incidental to salt-bag handling.

Electronic Mail Room

University of Maryland at College Park

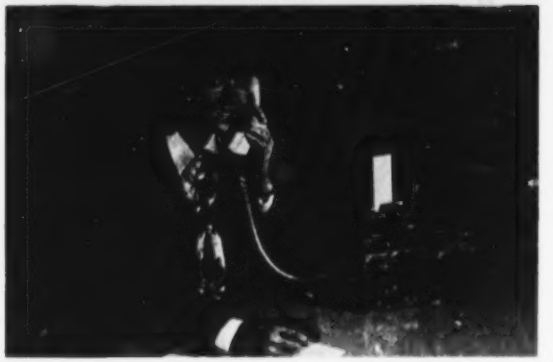
The University of Maryland at College Park established an electronic mail room on campus that allows for efficient receipt and dispatch of numerous types of electronic messages. It offers a central point for anyone who does not personally have access to computer equipment to receive electronic mail by placing the electronic hardware in the Campus Mail Service, allowing for the recipient of any electronic messages to receive messages on the same day (often within hours) of its arrival, and bringing an *annual savings of over $23,300 to the university.*

The electronic mail room incorporates electronic systems including intracampus and interuniversity electronic mail systems, Telex, facsimile, an electronic name and address data base, and a machine for the hearing-impaired. Electronic mail messages from off-campus, via networks, also are printed at the electronic mail room and given same-day delivery to campus recipients, allowing for an economical means of transmitting messages from across the state or nation to the campus.

Stop "Telephone Tag" with Automated Message System/Service

University of Washington

Some campus services depend heavily on telephone contact, which may mean leaving and receiving frequent messages to call back individuals—that is,



"telephone tag." The purchasing department at the University of Washington has used an automated voice message service for taking messages, which rents "mailboxes" and provides a toll free 800 number for vendors to call. *Use of the service results in a yearly savings of $28,000 for the university.*

With the new system, the purchasing department places one call to request quotes, and vendors respond with one call, leaving their information in the voice mailbox. The system cuts the number of call-backs for telephone quotes in half, assuming that there was an average of one call-back per quote in the past. Efficiency is gained because each quotation can be handled with one call, saving staff time. For frequent users who want many boxes, voice message systems are available for personal computers. The system is also useful when travelling,

since one can call in and get messages at any time from anywhere.

Cost of the service is $25 to $35 per box per month, depending on the level of options selected, with approximately another $20 to $25 per month per box for toll free access charges. The average cost per mail box is $50 per month, with a one-time setup fee of $15. Since the purchasing department pays the toll free access charges for vendor call-backs, these costs simply offset prior costs of repeated call-backs when long distance charges were being incurred.

Combining Voice and Data Communications Into An Integrated, Least-Cost Solution

University of Wisconsin-Stevens Point

The University of Wisconsin-Stevens Point installed an advanced, low-cost, voice and data communications system, using a voice and data needs integration technique and cost/benefit analysis to find a least-cost solution. *The results are an annual savings of over $367,200.*

Faced with an expensive, obsolete voice system, a desire to provide both voice and data communications in each of its 1,950 residence hall rooms, and an inadequate data communications network, the university decided on an approach to solving the problem. It used a Request-for-Proposal approach rather than a bid specification, thus supplying vendors with a wish list of what was needed for a voice and data system, without dictating the design. The university assigned "points" for each of nine evaluation categories and ranked each vendor proposal accordingly, while a separate subcommittee of its Request-for-Proposal evaluation team constructed a seven-year net present-value cost model of each proposal. There are at least 3,200 voice stations and 250 data links with the new system, and approximately 30 new stations are added to the network per month.

Service with Enthusiasm

Vanderbilt University

Vanderbilt University has developed a Service-with-Enthusiasm program, the core of a culture-building process on its campus, which focuses on service and productivity and *saves the institution $629,800 annually.* The program serves as a vehicle to disseminate the management philosophies and personal beliefs of the vice chancellor of administration to all employees, in order to build a more productive and enthusiastic service organization.

Special features of the program are: the vice chancellor's periodic meetings with employees in small groups for thirty minutes; introduction of each employee at the meetings with a statement about his/her department and role; the Service with Enthusiasm presentation by the vice chancellor, during which he shares his personal beliefs and values, offered as a code of ethics for the work place; distribution of personalized letters of welcome and appreciation and the document on Service with Enthusiasm written by the vice chancellor; and an opportunity for questions, comments, and discussion. Results of the program have been positive, affecting such areas as service, productivity, training, selection, and affirmative action, and have alleviated such problems as low employee morale, impaired productivity, poor communication, and unreliable service.

Reduce Workers' Compensation Roles

Western Michigan University

Western Michigan University's success in consolidating tasks with minimal requirements into a position which can be filled by injured workers performing within their limitations, enables workers to return to the work force, *and brings about a yearly savings of $100,000 for the university.* The program decreases the chances for an employee to become complacent from not reporting to work and helps to improve the employee's self image.

The program was designed to reduce the workers' compensation recipients' lists by reevaluating each person in nonwork status receiving workers' compensation in order to establish his or her ability to return to a work status, while at the same time attempting to identify jobs that could be filled by persons with limitations. The university determined that no one would be placed in a job which he/she could not fully perform, and it reestablished a work schedule as the first step to returning injured workers to the work force. Five persons were returned to the work force during the first month of the program, and the only cost was the evaluation, which is an on-going program with the workers' compensation operations. This same evaluation, in connection with available assignments, already has reduced the cost of workers' compensation by $5,000 per month. The program is to be expanded during 1986, and, as the university is self-insured, every dollar not spent is one saved.

Employee Health Insurance Cost Reduction Plan

Arkansas College

Arkansas College *saves $46,140 annually* in reducing health insurance cost by purchasing a higher deductible policy and funding a portion of the employees' deductible, and by instituting a Wellness Program and certain cost containment features.

The purchase of a high deductible comprehensive policy with the college paying a portion of the employees' deductible limits the loss risk to the difference in the deductibles and also reduces costs, since the premiums are less because of purchasing a higher-deductible policy. In operation, claims processing continues to be done by the insurance carrier, eliminating the objection of making decisions on questionable claims, along with any associated legal expenses, as would be required under a fully self-insured program. The college may also institute whatever kinds of cost containment it deems necessary instead of having to adopt a carrier's plan. Further savings are anticipated through using a preferred physicians group and by encouraging nonsmoking and the use of automobile seat belts.

Computerized Key Control Program

Beloit College

Having developed and implemented a microcomputer-based key control software program for controlling key issuance and reclamation records, Beloit College *annually saves over $2,450.*

Confronted with an inadequate key system, the college implemented a revitalization plan, two objectives of which were to rekey the campus locks and to develop an effective key-control records system.

Upon completion of rekeying, in-house key control software was developed with the following features: the software operates on a microcomputer rather than on the campus mainframe, allowing for easy department access to the files and affording total protection of the key control records from unauthorized personnel; the program is menu-driven and is easily operated by persons with no previous computer operations experience; records can be added and deleted quickly and easily; and listings may be made to the screen or printer, allowing for constant updating of hard-copy, key-issuance files.

Campus Shop at Berklee–Lease with Boston University

Berklee College of Music

Berklee College of Music's contractual arrangement with Boston University's subsidiary, the 660 Corporation, to operate the Berklee Bookstore, *provides the college with financial benefits—an annual savings of $93,500*—and with qualitative benefits, because of the services provided and the sensitivity of the institutional operator.

The financial advantages of a bookstore lease operation, using a 650-square-foot commercial area, previously leased by the college to a retail operator, included: elimination of the former bookstore inventory which was to be purchased by the contractor; a guaranteed percentage income from an operator who had a financial motivation to increase sales; return to the college of space formerly used for the Berklee store; and ability to expand store operations without the cost of additional personnel or risk of unprofitable decisions. In addition, the 660 operations' top management was comprised of many university administrators who were sensitive to the needs of the academic community, operations personnel had leasing experience, and the nearby store and warehouse provided a level of support not available in the limited Berklee space.

Reduction of Energy and Human Resource Needs with an Aesthetically Appealing and Erosion Resistent Natural Windbreak

Carl Sandburg College

As cold winter winds sweep snow and discomfort across the campus of Carl Sandburg College, energy and snow removal costs soar along with the frequency of complaints about drafts and treacherous conditions. College collaboration with the University of Illinois Agricultural Extension Service in designing several windbreaks of evergreen trees *provides the college with an annual savings of $10,000.*

The extension service conducted soil sampling, selected an appropriate mix of trees, and had their landscape architect design the layout, at no charge, the area's soil and conservation district provided a purchase at cost of trees consistent with the extension service's recommendations, and the state power company provided mulch at no cost.

The trees were planted, with the help of the college's agricultural students, in such fashion as to complement some older buildings on campus, reduce blowing snow and drifts and hence employment of snow removers, reduce weather discomfort to persons walking about campus, and reduce energy costs created by otherwise penetrating winds.

Copy Management on Campus

College of DuPage

Concerned over rising copy costs and complaints regarding the current centralized copy system, the College of DuPage underwent a comprehensive study, with the intent of keeping costs down yet maintaining the service and meeting the demands of all concerned. Based upon results of the study,

a decentralized concept was enacted which *improves service and annually saves the college $206,250.*

The decentralized concept involved placing copiers strategically in heavy use areas and suiting the copier to user needs, as determined by the survey. The idea of having one point of copier control for all campus departments and one vendor to minimize costs while assuming maximum accountability for copier performance, service, support, and supply was approved, and a vendor was selected from nine invited to bid.

Savings were realized in the reduction in turnaround time, of standing in line for copies, and of trips to the central copy center for quick copies, as well as in increased service with no additional staffing, in purchasing supplies at quantity discounts, in more in-house copy jobs at lower rates, and in the virtual elimination of overtime.

Microbudget System and Video Training

Dallas County Community College District

Dallas County Community College District developed a system to download budget data from the main computer to microcomputers. *Results of the development are an annual savings of $52,000.* Individual budgets for approximately 200 work centers were prepared on the microcomputers, consolidated by individual campuses, and uploaded to the main computer. A video was made to train users of this new system.

In contrast to the previous system's delayed error spotting, manual calculations of changes in totals, and delayed calculations of total requested budgets, the new microbudget has several advantageous features: extensive editing is performed by the microcomputer, so errors are now detected and corrected immediately at the work center level; the total requested amount for the division and work center are always displayed, virtually eliminating manual calculations; the campuses can consolidate the work centers in various ways; and several printed reports are available at the work center, super work center, or campus level.

Residence Hall Refurnishing

Emporia State University

Joint development with Kansas Correctional Industries of a custom line of institutional furniture at low cost, enabling Emporia State University to completely refurnish all its residence halls at one time, *saved the university just over $64,000.* In its search for a line of institutional furniture that was durable, constructed of solid wood, and could be fastened together into various units, as a replacement for its aging residence hall furniture, the university attempted to design such furniture and locate a manufacturer to build it according to specifications. The university suggested to Kansas Correctional Industries (a state agency) that it manufacture a piece to meet the specifications. The new undertaking proved successful. The university could purchase as much furniture as the budget permitted and receive it quickly. There was no need to follow a time-consuming formal bid process, as the university is able to purchase directly from other state agencies without bidding. It was found that similar furniture from other sources would be three to four times more expensive, and furniture repairs are easily performed at a significantly low cost by Correctional Industries, with very short down time.

Self-Propelled Scaffolds

Georgia State University

Georgia State University reduced the number of hours required for overhead work by obtaining battery operated, self-propelled scaffolds, *which annually save the university $4,640.*

Part of a cafeteria renovation project involved replacing over 2,600 square feet of ceiling tile and light fixtures, which meant that if the department used traditional scaffolds, it would require two trades-helpers during the nine-week project to move and position the rolling scaffolds for craftworkers. The university decided to use a six-foot long, battery propelled scaffold which can be used for working at heights of up to 12 and 1/2 feet. The scaffold folds, fits in elevators, and can be assembled quickly. Craftworkers can propel themselves quickly and easily without leaving the scaffold platform, almost no assembly is required for setting up the scaffold, and the scaffold requires little maintenance. The battery for the scaffold is recharged by plugging the unit into a 110 volt outlet overnight, and the life expectancy for the unit is ten years.

Harvard Depository–Phase 1 (1.7M Volumes)

Harvard University

To resolve a universitywide library space problem, Harvard University constructed a centralized depository thirty miles from the main campus libraries, *supplying the university with a yearly savings of $751,400.* Phase 1 of the Harvard Depository (11

phases in total are projected) will accommodate approximately 1,700,000 volumes.

The depository accommodates collections, ideally with low usage patterns, with 24-hour (or same-day-emergency delivery) service to the depositing libraries. Incorporated in this building concept are a new method of storing books at much higher density, mobile horizontal and vertical access to book storage and a computerized bar code inventory system, employment of cost-effective, high-bay building and shelving, and a precedent-setting operating plan for proper book conservation at very low costs, using mechanical and security innovations.

In researching and visiting other university deposit libraries, it was found that the operating costs of an alternative facility, one found to be the most like Harvard's, and built to address essentially the same problems, cost three times as much.

Effective Cleaning of Acoustical Ceiling Tiles

Iowa State University of Science and Technology

Remodeling an office area at Iowa State University of Science and Technology required renovating the stained and soiled acoustical ceiling. Instead of replacing or painting the tiles, the university used a new method of chemically cleaning the tiles. This method is faster, less disruptive of work area, and much cheaper than the other methods, ***providing the university with an annual savings of just over $18,000.*** In addition, it left the tiles looking like new.

The new method, for acoustic tiles only, consists of cleaning tiles and metal frames with patented chemicals. The chemical types "A," "B," "C," and a tile wash are used according to the type of tile and soiling involved, and then a special compound is used to remove stained areas around air vents or water spots which were not cleaned with the normal procedures. A spray wand is used to apply the appropriate chemical to both tile and gridwork.

University-Assembled Computers Save Dollars

John B. Stetson University

The John B. Stetson University discovered that by assembling its own computers from parts provided by wholesale distributors, a savings of over $2,000 per computer was possible and maintenance contracts were no longer necessary. ***Results are a yearly savings of $78,700 for the university.***

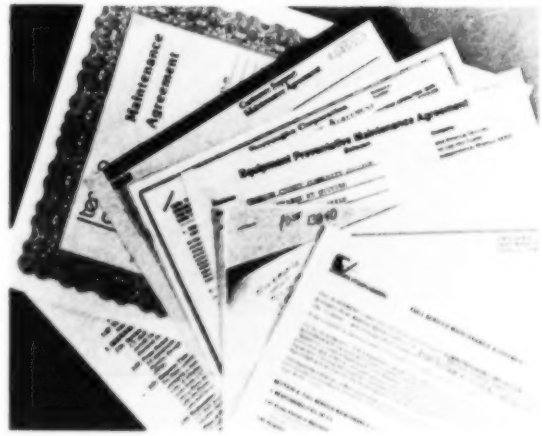
With the help of a wholesale distributor, the director of personnel at the university assembled a machine that was not only equal to but in many ways better than the well-known computer for which it was substituting. Within days, other departments who were in need of microcomputer capabilities were placing orders for the much more affordable system, which did not require employees to rely on computer stores for the maintenance and support of the microcomputers.

It was then agreed that, if funds could be obtained for the purchase of the parts for the 11 units needed for the Business School, the director of personnel would teach interested students and faculty members how to assemble computers. With this was born the idea of Computer Lab students assembling their own computers and training other students in the technique of computer assembly, maintenance, and operation.

Maintenance Contract Cost Reductions through Centralized Self Insurance

Johnson County Community College

Johnson County Community College's former system of decentralized maintenance contracts individually negotiated by various budget administrators resulted in an annual expenditure of approximately $300,000. Through a comprehensive cost-benefit analysis of all contracts, a new procedure was developed whereby the college centralized negotiation of all maintenance contracts in one office. By developing a procedure for assumed risk through a self-insurance pool of funds, ***the college saves $116,100 annually.***



Centralization eliminated duplicate contracts, maximized dollars spent, and maintained or exceeded all levels of service contained in previously negotiated contracts. The self-insurance pool was created to provide for repairs or breakdowns of equipment previously covered by maintenance or service contracts. Funds were made available for the pool through savings realized from the nonrenewal of specific contracts.

Library Conversion Project

Kearney State College

In converting manually produced card catalog records to a machine readable format, ***Kearney State College saves $11,906 annually*** by using an on-line computer cataloging subsystem during nonprime time hours.

As the college had already contracted for the subsystem services in 1976, which allowed the library to enter its current cataloging production into the subsystem database, only those records prior to 1976 had to be converted to a machine readable format, a process called "retrospective

conversion." This amounted to 90,049 cataloged titles.

It was decided that a newly created position, Library Technician, would be devoted to the conversion project, and that the position would require evening and Saturday work hours. These hours were crucial to the savings involved in the conversion project, because if the conversion system was used after the prime time hours of 9–5 Ohio time or 8–4 Central Standard Time, $1.00 per title could be saved. During the first year, 11,906 titles were converted from manual records to machine readable format.

Quick-Couple Irrigation System Replacement Covers

Lewis-Clark State College

Protective covers for quick-couple irrigation system valves frequently are lost, and rocks and dirt enter the system. As an alternative to replacing valves with broken covers, they can be quickly and inexpensively protected by inserting a valve stem from any large internal combustion engine. These valve stems are a free byproduct of any automotive repair program, *and provide Lewis-Clark College with an annual savings of $5,300.*

Quick-couple irrigation systems remain an effective, low maintenance campus watering method, despite the development of timed automatic systems, which operate less labor-intensively, but are relatively expensive to install and especially subject to accidental breakage and vandalism. The college's more recently installed systems are automatic, but because the old, quick-couple system is in place and can be operated effectively by summer student employees, the college has no plans or money to replace it.

Dropping the salvaged valve stems, painted red for easy location and cut 2 1/2 inches in length, into the open quick-couple valves, eliminates the cost of buying new valves and significantly saves on installation and maintenance time.

Loyola College Business Center Real Estate Project

Loyola College

The Loyola College Business Center is the commercial development of office space using an Industrial Revenue Bond to gain tax-exempt financing for the project, which is to be owned by a limited partnership. Loyola College, through its wholly owned subsidiary real estate corporation, will own one-third of the venture, which is designed to lower the occupancy costs of the college's satellite campus in Columbia, Maryland and to create a nontraditional revenue source through rental of speculative office space. *The results are an annual savings of $105,580 for the college.*

The project consists of two commercial office buildings to be constructed in two phases. The first phase is a three-story building containing 52,700 square feet; phase two will be a two-story office building containing 28,000 square feet. Phase two of the project is optional and dependent on the successful leasing of the flagship building.

Direct Purchase of Natural Gas

Mary Baldwin College

The Federal Energy Regulatory Commission (FERC) recently adopted regulations which made it possible for Mary Baldwin College to purchase natural gas directly from producers through interstate pipeline systems. A separate agreement was made with the local pipeline distribution company to transport gas to the two college boiler plants. *The resulting annual savings are $72,330.*

Quantities of gas purchased were determined on a monthly basis through special nomination procedures. The gas transmission agent informed the college of the delivered price of gas for the succeeding month, and the college named the quantity it desired to purchase that month. Any excess not consumed was automatically placed in a "bank" for future use. Gas was purchased using dekatherms as the measuring unit to ensure equitable heat quantity.

The college had pursued many avenues to reduce fuel costs through reduced consumption, but many gains were offset by increased cost of fuel. Direct purchase provided considerable savings in fuel cost.

24-Hour, Self-Serve, Automated Motor Vehicle Fuel-Dispensing System

Michigan State University

Michigan State University remodeled its service station, installing fuel dispensers and associated equipment, all monitored and controlled by microcomputer. The system provides 24-hour fleet refueling with completely automated fuel dispensing capability and eliminates inventory discrepancies. In addition to reduced cost and expanded service, other feature improvements include faster flowing pumps and convenient customer self-service, entirely eliminating the need for service station attendants. *The new system saves the university just over $58,800 annually.*

Two "credit cards" are the keys to the system, as both are needed to "unlock" the fuel pumps. The vehicle card, color-coded blue, identifies and remains with the unit. The driver's card, color-coded red, is assigned to the principal driver or remains with the vehicle keys to identify the customer. The driver then must enter the vehicle odometer reading on a keypad at the service island, so that the computer can determine whether the demand for fuel is within acceptable parameters before fuel can be dispensed.

Two-Year Textbook Adoption List

Midlands Technical College

Midlands Technical College implemented a program requiring academic department heads to provide to the bookstore director a list of all textbooks to be used in their courses during the next two years, as opposed to the annual list used in the past. *The results are an annual savings of more than $4,300 for the college.*

The two-year adoption list significantly reduced faculty time in requesting books, since the list was integrated into the college computer system, allowing faculty members to enter only changes to their current list of textbooks rather than to submit an entire list. It created reductions in book costs for students, as more lower-cost, used textbooks could be purchased and used for another year, and also allowed for greater long-range planning and cost savings in college bookstores.

If a new textbook were viewed as essential to the curriculum, the biennial procedure would not restrict special orders.

"Hot Line" Telephone System

Monroe Community College

A "hot line" telephone system was installed at Monroe Community College, consisting of seven telephones strategically placed in the instructional area hallways, for the purpose of requesting aid for such matters as malfunctioning instructional equipment, lack of essential instructional supplies, and medical or other types of emergencies. *The system annually saves the college more than $35,500.*

No dialing is necessary for the telephone system, because when the phone is taken off the hook, an immediate ring takes place at the Public Safety Dispatch area, which is staffed twenty-four hours a day. The telephones are unobtrusive in that they cannot be "called" and therefore do not ring.

Technical requirements are cabling, conventional wall-mount telephones, an RP400 telephone receiver at the receiving location, and minimal software. The RP400 receiver is essential, as an LED readout capability is provided in event of emergency. As soon as ringing begins, the telephone station location is displayed automatically, making it unnecessary even to speak in order to receive assistance.

Reduction of Word Processing Costs

Montgomery County Community College

Montgomery County Community College significantly reduced its word processing costs by replacing single-sheet bond paper with less expensive computer paper for all drafts, and by printing lengthy documents and form letters at night on unattended machines. *The annual savings realized are just under $5,300.*

Since documents may go through as many as ten drafts before a final form document is ready for circulation, the use of inexpensive, continuous-form, recycled computer paper has eliminated the excessive use of expensive bond paper. A tractor feeder is attached to the printer to allow printing of lengthy letters without the need for an operator, and a single-sheet feeder is attached to allow printing of "personalized" letters, once again eliminating the need for an attendant. Running printers 24 hours a day reduces the demand for equipment and personnel (and thus the cost to employ them) while increasing production.

Green Grass From Brown Trash

New Mexico State University

Using its hybrid Bermuda grass clippings from stadium turf to plant new grass areas, New Mexico State University eliminated the need to buy sod from an outside source. *The university accumulates an annual savings of $1,350.*

Hybrid Bermuda grass is very durable, does not tear easily, spreads to fill any tears that may occur, and thrives in heat and intense sunlight. However, a major drawback is the expense of starting it, as the only way to create a grassed area is by planting pieces of live grass—either as sod or stolons (chopped-up sod without the soil), a much more expensive process than seeding.

As landscaping plans for a newly constructed building called for a Bermuda grass lawn, the university used the stadium's stolons, generated from the stadium's Bermuda turf's annual "scalping"—when the grass is repeatedly mowed down to bare soil to ensure that the turf grows back uniformly dense and tough—instead of purchasing stolons from a commercial turf grower. To purchase the stolons would have cost around $1,350, whereas the stolons on campus are produced as a byproduct of another operation.

Consolidation of Federal Express Mail Shipments

Northwestern University

Northwestern University entered into an agreement with Federal Express that will reduce Federal Express charges by 40 to 50 percent while also cutting other Federal Express-related processing costs. Federal Express is offering Northwestern University these discounts because the university is consolidating to two pick-up points and one account number, *resulting in an annual savings of just under $138,800 for the university.*

In the past, 65 individual departments or areas had Federal Express account numbers in use with Federal Express picking up from each one. The paperwork involved was cumbersome, resulting in many overdue invoices, and the university was paying full charges while 40- to 50-percent discounts would be offered if it were to centralize Federal Express shipments and use a single account number instead of 65 separate ones.

The solution decided on was to make the university's two main mail rooms the central handling points, with pick-ups handled on an "on-call" basis by university mail services drivers. A new position was created for chargebacks and processing. Because of the large volume of university shipments, Federal Express offered the university the use of scales, a mini-computer, and a printer for processing.

New Repair Method for Dining Hall Conveyors

Ohio University

Dining conveyor belts at Ohio University are used to return dishes from the serving area to the dish room. Historically, the rollers that carried the belt failed within one year, because of bearing, roller, and shaft failures caused by water. The staff in the maintenance department developed a new roller assembly using a design similar to that of the original product, but with different materials at substantial cost savings. From the date of implementation to the present, there have been no conveyor-line failures. *Annual savings for the university amount to $2,400 annually.*

To fix the roller problem in the past, the building maintenance department staff would have to order or have in inventory the roller and bearing units and replace each damaged unit. The staff developed a less costly, more durable assembly unit by using a standard 1/2" steel shaft and inserting it into a common 1 1/2" PVC pipe cut to length, and then packing it with grease and fitting standard ball bearings in both ends.

Production Planning and Scheduling for Physical Plant Technical-Service Trade Crews and the Tasks They Perform

Pennsylvania State University

Pennsylvania State University developed a technique using a microcomputer that involves preparation of a weekly work schedule by forecasting future workload and comparing work requirements to manpower availability. This scheduling procedure provides a consistent and desirable means of completing physical plant tasks and controlling manpower utilization, and *provides the university with an annual savings of more than $36,000.*

To accomplish scheduling, microcomputer spreadsheets are used to determine and compare work hours available to work-hour requirements, while other spreadsheets are used to adjust available work hours, schedule tasks, and evaluate results. The advantage of using a spreadsheet to manipulate this information is that by using the simple spreadsheet commands available, phases of tasks can be rescheduled, altered, extended, or added to meet worksite conditions. Macro programs, which are "user prepared," are also written to sort and categorize specific trades in order to summarize the total manpower for each trade required to perform scheduled tasks.

Purdue Energy and Utility System

Purdue University

Purdue University developed the Purdue Energy and Utility System, a computer program that provides electric utility bill verification, reporting, management, projection, analysis, and rate comparison. *The system provides the university with an annual savings of $16,900.*

The program contains the various rate structures for 56 different bills, representing 9 different billing methods. The database contains 12 months of historical data for easy comparison and use in budget projections, different-rate analysis, and "what-if" analysis.

Dollar savings are realized from time saved during bill verification, budget projections, rate comparisons, and hypothetical situations, from use of the rate comparison portion of the program in calculating electrical accounts, and from determining the most cost-efficient period for shutting down the university's electrical turbine generator by the input of estimated half-hour demand loads during peak times.

Six-Foot Corrugated Steel Pipe As A Utility Tunnel

Southern Utah State College

Confronted with either tolerating an energy-line loss of 50 percent, or waiting for legislative funding to install concrete tunnels, the college chose to delve into its energy budget surplus to purchase and install a corrugated, steel utility tunnel complex, a system using six-foot diameter, galvanized, corrugated steel pipe, in lieu of concrete, because of the huge cost differential. Such tunnels eliminate energy-line loss, protect buildings, and provide convenient access to each building on campus, *saving the college $125,000 annually.*

Steam, condensate, and culinary water lines are hung from racks along one side of the tunnel, and communications lines are placed in a cable tray suspended from the other side. Insulation can be easily accomplished and inspections can be made by a quick walk-through. Repairs can easily be made, sidewalks above are never icy, heating line loss is minimal, and additional cable can be placed in the cable tray as needed.

Line-Driver Technology

Spring Hill College

Spring Hill College reduced its remote communications costs by using Bell "Local Area Data" lines with line-drivers at user points. *Yearly savings for the college amount to more than $2,300.*

Because of lightning damage to its existing computer facilities, the college faced the problem of reconnecting six remote computer lines, located in five different on-campus buildings, to the institution's VAX computer. Possible solutions to the problem were laying the college's own cable, using Multiplexers and modems, using 1,200 baud modems and regular telephone lines, or using line-drivers and Bell "Local Area Data Lines."

The last choice was adopted for the following reasons: it cost only $1,525 to implement; it offered 4,800-baud communications instead of the much slower 1,200-baud offered by some of the other methods; it reduced the continuing costs in several ways, as the Bell "L.A.D." lines only cost $48 per month instead of $156 per month for the 12 modem lines, and the real cost of the lightning damage was two $75-line-drivers instead of a $1100 VAX communications adapter.

Alterations of Mechanical Heating Plant for TVCC's Administration Building

Treasure Valley Community College

By converting the heating and cooling system in its administration building from an open-loop, water-to-water system using city supplied river water to a fully closed boiler and chiller system, Treasure Valley Community College was able to conserve 57,258,190 gallons of water in one year. *Results are an annual savings of more than $47,000.*

To accomplish conversion, the entire system was repiped, eight gas-fired hydronic pulse combustion boilers were installed for heating, and the existing heat pump was used for the chiller with an aircoil cooling tower for its water source.

At Treasure Valley Community College, because of the particular circumstances of the previous open-loop system, the coldness of the water source, and the damage to the existing boiler system, the new closed-loop, high pulsating boiler system should pay for itself in less than two years.

Incoming Bulk Mail Reduction Program

University of Colorado at Boulder

The University of Colorado at Boulder initiated a new program to cut down on the time, effort, and dollars required to process incoming, misaddressed and unwanted second and third class bulk-rate mail on a long-term basis. *Results are an annual savings of just under $6,000 for the university.*

It is believed that the recent tremendous increases in bulk mail at the Boulder Campus directly result from the selling and reselling of computerized mailing lists. The volume of this bulk mail will cause reduced service levels for all mail processed by the university mailing department in the near future, without increased resources, and much of the bulk mail received is addressed incorrectly. The problem grows as the incorrect as well as obsolete names and addresses are sold and resold.

The new program uses custom-designed address cards and requests mailing lists directly from publishers, enabling the university to correct or delete names and addresses from the list. Now lists being sold and resold will contain corrected information.

Automotive Fuel Billing System

University of Houston–University Park

The University of Houston–University Park is now recording information for billing fuel usage to university vehicles on a microcomputer spreadsheet by capturing the information when fuel is dispensed. Using computer data for charging eliminates the time-consuming manual recording, sorting, and charging out of fuel at the end of the month, *and saves the university $3,700 annually.*

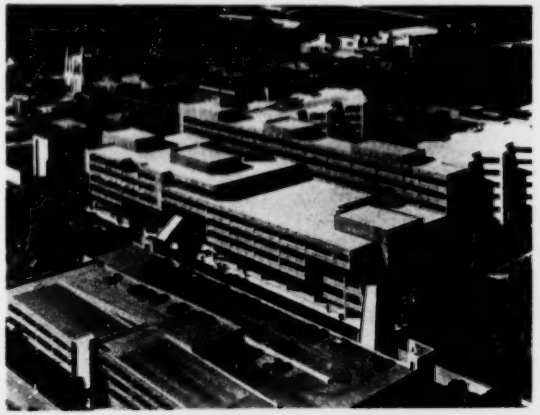
With the new system, a worksheet file was set up for each university department on the microcomputer, using a spreadsheet/database program. Each worksheet contains the vehicle number and fuel type for each departmental vehicle, with 32 rows set up to record daily fuel usage and total monthly consumption. Formulas entered into this row automatically calculate the gallons of fuel purchased to date each time an entry is made for a particular vehicle.

Data is now entered directly into the computer by the issuing clerk at the time of purchase. The worksheets are saved as files in the microcomputer's ten megabyte hard disk and backed up periodically on floppy disks.

Aggregate Versus Nonaggregate Bidding Concept

The University of Iowa

The University of Iowa purchasing department collaborated with the University of Iowa Hospitals and Clinics Stores Department to develop a totally new competitive bidding concept for its 2,161 medical/surgical supply items. To obtain maximum savings for the hospitals' cost-containment program, the purchasing department developed the concept of creating a dual-bid proposal package, involving both "aggregate" (full supply line vendors) and "nonaggregate" (independent vendors and manufacturers) bidders. *Results are an annual savings of just under $711,000.*



The purchasing department entered into a computer program all primary information for each of the 2,161 items including name, size, manufacturer's product number, commodity grouping or individual items within the grouping, bid package amounts, and anticipated quantities to be ordered during the contract period. Both concept bid packages included a listing and analysis of the 2,161 items which were to be part of the bid award for the year. Of the 309 individual vendors who received a request for bids, 175 submitted bids, and 3 out of 5 full-line vendors participated in the aggregate bidding concept.

Open-Market Purchase of Natural Gas

University of Oklahoma

The University of Oklahoma reduced the cost of its heating plant natural gas by more than 14 percent by purchasing natural gas directly from the well head. Gas was delivered to the power plant by separate lease of pipeline capacity from the local gas utility company. *Annual savings are more than $485,500.*

Gas delivery was made possible because of an internal policy change made by the local gas company that allows the company to lease out a portion of its pipeline capacity to transport third-party gas. Previously, the university had considered building its own natural gas line and connecting it to a nearby interstate line. With the new method, no capital outlay for construction was necessary. The charge for delivery of third-party gas to the university is 51.8 cents per Mcf.

Federal Express Billing Aggregation

University of Pennsylvania

The University of Pennsylvania negotiated a new contract with Federal Express that aggregated all existing accounts in the university into one central billing account. *The results are an annual savings of $195,000 to the university.*

Individual departments could still have their own Federal Express accounts, but the billing for all of them would be made to the one central office, Penn Mail Service. This "corralling" of all accounts into the one account gave a discount to all departments using Federal Express, and, because of the increased total retail value of the university's shipping, caused the discount percentage to increase. Additional savings occurred because of the reduced number of checks that had to be cut by the accounts-payable department each month to pay the many individual bills that previously had been separately processed, and the workload was lessened for user departments that no longer had to process their own paperwork for payments to Federal Express.

Growth Retardants Reduce Work Hours at UTC

The University of Tennessee at Chattanooga

An experimental program was introduced to retard the rate of vegetative growth on certain slopes on the University of Tennessee campus. The slopes were too steep to mow and almost too steep to stand on while using a grass trimmer, creating a hazardous situation for groundskeepers. The

growth retardant cuts maintenance time by two-thirds, thereby creating a healthier working climate for the employees, and *providing the university with an annual savings of $7,420.*

The growth retardant used allows the university to maintain vegetation and green color on the slopes, while reducing the required mowings by 60 percent and thus reducing maintenance costs, potentially dangerous working conditions, and wear and tear on machinery. The manpower originally spent on maintaining slopes can now be channeled to other projects.

Microcomputer Lab Shared Software

University of Wisconsin–Green Bay

Twenty-six microcomputers and 12 units were networked together to share software by using a central disk server at the University of Wiconsin's Green Bay campus. Six micros share one printer via use of a switch box. The system is capable of supporting up to 64 devices and multiple operating systems. ***Annual savings as a result of the networking are more than $19,700 for the university.***

To receive access to the micros, a faculty member submits a class roster to the computer center and the center returns usage cards to him or her for all students for that semester. There is no charge to the student or college of study for this usage. Each student is provided with a description of how to access the particular program they will be using, and consultants are available to help students at the outset. Those students who wish to use the micros for word processing pay $5.00 a semester. The computer center also conducts workshops in using some applications, including word processing. The procedure has improved the students' learning in introductory micro courses, and the staff no longer has to repair disks or spend time mailing in disks for replacement.

Coal Qualification Evaluation Project

Utah State University

For years Utah State University had been purchasing coal, using price-per-ton and cost of transportation as the only criteria. After experiencing coal degradation that caused considerable boiler damage as well as handling and storage difficulties, the university decided to implement an ongoing coal supplier qualification-evaluation project. The results were coal energy savings and reduced coal-fired boiler maintenance costs. *Annual savings for the university are $125,000.*

For the evaluation project, coal quality data were gathered, comparing representative coal samples against manufacturers' design coal specifications. The results of the comparison showed that the inventoried coal quality did not meet manufacturers' specifications, thus helping to explain the university's past experience with coal-related problems. New university coal bid specifications were written to coincide with the design coal quality information, and a bid solicitation was made for 5,000 tons of coal. Four vendors responded to the bid, and an evaluation of all bids was conducted, consisting of a technical evaluation, an economic evaluation, test burns, and a final delivery cost calculation. The vendor whose coal was selected provided a margin of safety well within the design coal quality information as provided by the boiler manufacturer.

Computer-Sequenced Electrical System Restarts

Washington State University

Washington State University used existing computerized energy management systems to sequentially restart systems following "brown-outs" or total power failures, significantly improving electrical power reliability and avoiding costs associated with research interruptions and equipment failure. *The results are an annual savings of $25,000 to the university.*

The university's major building systems are controlled by the physical plant's computer-based temperature control system (CCMS), which is capable of distributing data processing to system microcomputers located in the building mechanical rooms. The remote processors are linked to the central processor via a communications trunk; thus, they are monitored and alarms are reported. Faced with the problem of total power failures and the ensuing simultaneous startup of all the building ventilation systems on the same feeder, a unique software addition was incorporated in the CCMS to provide "delay recovery" of the motors on each feeder in a sequential order, given that the remote microprocessors would independently control individual building systems. The software addition consisted of a commandable point, installed as a power recovery point in each remote processor's software.

Fire Safety Equipment Management System (FSEMS)

Yale University

Yale University developed the FSEMS, a computer-assisted system providing effective information

recording and retrieval capability to help management, supervisory, and maintenance staff perform their duties. *Resulting annual savings from development of the program are $103,250 for the university.*

The university's objective for the system was to provide quickly and at a reasonable cost an information system that can accommodate twenty or more different classes of fire safety equipment. The objective was accomplished, employing one analyst/programmer, with one month being devoted to analysis and one month to programming, and using a data-base structure and its attendant programming language.

The data base from which all systems products are produced is composed of the following information: equipment category and description; building in which installed and precise location within building; technical data; and maintenance dates and performance time standards. The fire marshal staff loads and maintains data via a video display terminal. Scheduled and ad hoc reports are produced on-site by a remote printer.

Comprehensive Maintenance Checklist Design

The George Washington University

The physical plant department at the George Washington University started using checklists to monitor the progress and accomplishments of various maintenance procedures. Many of the checklists were designed so that contract labor could be replaced; others were developed so that workers' progress and thoroughness could be measured. The checklists either replaced contract personnel or eliminated the need for inspectors to tediously inspect a building and then report on work needed. The checklist form reports concisely the present condition of a piece of equipment or building component, whether repairs are needed, what repairs were actually done and when, and if any repairs to be done later are necessary. *The resulting annual savings are $92,800.*

Chilled Water Coils Winter Set-Up

Iowa State University of Science and Technology

Each fall, chilled water coils must be taken out of service at Iowa State University of Science and Technology to ensure that they will not freeze when exposed to winter outside air being used for ventilation. Past procedures used a flushing technique with antifreeze to make sure no freezable fluid was left in the coil—a very labor-intensive procedure. A new technique uses a piece of flexible duct that is connected to the discharge of the air handler on one end and to a 3" to 4" plumbing connection on the coil at the other end. Closed isolation valves keep the coil from the piping system and the flexible duct is connected with a simple hose clamp. After about a week's time, when the coil is completely dried out, the arrangement is disconnected and the coil is left dry until the next spring. The entire procedure requires about one hour of time, *resulting in a yearly savings of $27,950 for the university.*

Cooperative Purchasing: Educational and Governmental

Iowa State University of Science and Technology

The search for ways to save on purchasing led Iowa State University to explore the idea of combined purchasing with the Iowa Department of Transportation. Several similarities existed between the two, as they both were located in the same city, had computerized inventories, used many of the same maintenance supplies, and each maintained a stocking warehouse. An agreement was made between the two in which each organization purchases commonly used maintenance supply items from the other, with the following objectives in mind: to reduce inventory dollars; to reduce reserve stock; to lower merchandise costs; and to reduce buyer's acquisition time. *Results are a yearly savings of $18,000 for the university.*

Control of Student Computer Paper Costs

Montgomery County Community College

Attempting to keep the growing costs of computer paper down in its academic computing program, Montgomery County Community College initiated a two-step program to reduce paper consumption. It eliminated unnecessary header sheets, reducing each printout by one to three pages, depending on the particular programming language being used, and it introduced a technique to reroute students' computer output to their terminals during testing and debugging of their programs, so that students could view the results of preliminary attempts to compile and execute their programming assignments and make corrections without having to print the results with the errors on paper, as was the former routine. *Annual savings resulting are $2,550.*

Communications Superhighways

North Carolina State University

North Carolina State University has changed its method of installing computer and telecommunications cables on all new construction and renovation projects. It involves a superhighway concept for communications cables in campus buildings, using a common wireway with a hinged cover installed in the main corridors of the buildings. The installation is made as close to the ceiling as possible but still allows the raceway to be opened at the top. The wireway has regularly spaced knock-outs which serve as connection points for metal conduit going into individual rooms along the corridor. *Annual savings as a result of the new method are just under $365,000 for the university.*

Use of Metal Inserts in Door Repair

Texas Tech University

The incidence of door hinge failure is high throughout campus buildings at Texas Tech University. The university determined that typical door malfunction involved loose hinges on both the door and jamb. The major cause appeared to be high usage, and the most common problem was identified as three to six loose screws in both the door and jamb. The old repair procedure usually took about two hours. The university was able to find a commercial source of threaded inserts, known as "wood-serts," designed specifically to address the problem. They are made of zinc chromate finished metal, threaded and slotted for screw driver application. These devices are easily installed and, when purchased in standard pack lots of ten, cost an average of 68 cents each. Using this device, door repair now takes about 20 minutes to accomplish. *Use of the inserts provides a yearly savings of more than $2,500 to the university.*

Asbestos Abatement Program

The University of Alabama

The University of Alabama, through the Office of Health and Safety, has implemented an asbestos abatement program for the university community. The program uses university employees to address abatement on a daily basis, providing a variety of related services required by regulating agencies, such as: surveying all buildings on campus for friable asbestos-containing materials; prioritizing areas for abatement; developing an operations and maintenance program; training university employees in other departments to recognize suspect materials; as well as providing information on the use of protective clothing, respiratory protection, and related equipment. *Annual savings stemming from 19 abatement projects completed in-house rather than through a private firm, and other factors such as insurance savings and reduced liability, amount to $442,300.*

An Online Computerized System for Space Inventory and Space Utilization

The University of Alabama

The University of Alabama converted its batch or demand-type Space Management System, which uses keypunched cards, to an online system that transmits messages from a communications terminal to the mainframe computer. The Space Management System master file is now stored on a fixed, hard-disk pack that can be accessed at any time. All transactions to the file are processed through a terminal to the main frame computer. Updates to the file are processed daily. Small and medium-sized reports can be printed and received within four hours, and large reports can be requested in the morning and received by the next work day. Daily backup to the online system is provided by five reels of magnetic tape that are alternated so that the oldest tape is updated each day. *Annual savings for the university are $19,700.*

Paycheck Message

University of Pennsylvania

The University of Pennsylvania decided to include a message box on a detachable portion of its employees' paycheck or advice of pay, in which any type of message, seven lines with 50 characters, could be printed. It is programmed so that if desired, a particular employee type only, or a combination of employee types will receive a message. This capability has reduced, and in some cases eliminated, the need for separate mailings, where otherwise up to 28,000 separate notifications would have been necessary each month. The paycheck message procedure also virtually guarantees that a message will be delivered and received by an employee. The idea was conceived while other changes were being made to the paycheck. *Yearly savings for the university amount to $17,250.*

Automated Wire Pulling for Cable Tray Installations

University of Washington

After installing cable trays to hold its telephone, intercommunication, and computer cabling, the University of Washington needed a simple way to install additional wire as requested. An electrician in the electric shop thought of using a radio controlled model tank to pull a heavy string or thin, flexible wire down the cable tray to the new location. A tank was a logical choice with its caterpillar tread, which can climb a grade and go over obstacles, and can be turned right or left. A tank was purchased from Radio Shack and modified to also reverse its direction. The tank could do in 15 minutes what it used to take two people one hour to do. *Annual savings are more than $7,200 in labor costs for the university.*

Association of Yale Alumni Event-Tracking System

Yale University

Yale University developed an alumni event-tracking system to provide administrative support for the staff and directors of the Association of Yale Alumni (AYA). This support includes enhanced recordkeeping, statistical analysis, correspondence, and form generation for the many alumni events scheduled each year. The system is comprised of eight distinctly separate applications running on several personal computers. The computer software was developed by university staff, based on requirements from the AYA staff. These programs are all menu-driven and several are operated and maintained by part-time students. Both time and costs (formerly incurred by contracting with outside agencies) have been saved in using the system. *Results are an annual savings of $20,000 for the university.*

Other 1986 Participants

Alma College
- Call Management and Least Cost Routing System

Ashland College
- Campus Energy Management and Control

Beloit College
- Volume Reduction with Variable Speed Drives

Blackburn College
- Drill Your Own Oil and Gas

Brandeis University
- Alternative for Service Employees Using Neighborhood Work Program
- Lighting Retrofit Project

Carl Sandburg College
- Records Retention

Carnegie-Mellon University
- Food Cost Reduction in Dining Services

Cazenovia College
- Maximizing Results with Micro-Computers

Central Michigan University
- Computerization of Salary Surveys and Annual Analysis
- Construction-Related Purchase Orders
- Control Card Form Design and Control Via Microcomputer
- Elimination of a Central Bakeshop
- Graduation–Commencement Listing–Download to University Press
- Handicapped Parking Relocation Program
- Health Plan Membership Reporting by Microcomputer
- Minimizing Long Distance Telephone Costs with Microcomputers
- Residence Hall Director Apartment Self-Sufficiency Project
- Storage Facility Construction
- User Groups
- Wood Energy System

Clemson University
- Converting Incandescent "Exit Lights" to Fluorescent

The College of the Holy Cross
- In-House Custodial Equipment Repair Shop

College of Mount St. Joseph
- Use of Vacuum System for Maintaining Campus Grounds

The Colorado College
- Energy Conservation at Honnen Ice Rink
- Lease-Purchase of a Highway Bus

Concordia College
- In-House Upholstery Program

Concordia Seminary
- Steam Boiler Efficiency Modification

Concordia Teachers College
- Irrigation Well and Heat Pump System

Crowder College
- College Automobile Fleet Cost-Reduction Plan

Delaware State College
- Shared Energy Savings

DePaul University
- Alternative Use of Telephone Cable
- Centralized Photocopy Production and Delivery Center
- Cost-Sharing Sidewalk Replacement Program
- Supplies Service Center

De Pauw University
- De-aerator Vent Heat Recovery Project

Drew University
- The Donated Motor Pool

Duke University
- University Reduces Expenses Associated with Purchasing Printed Forms

Eastern New Mexico University
- Revision of Accounts Payable–First Step to Records Management
- Expansion of Telecommunications Services

Elizabethtown College
- Heating/Cooling a Newly Renovated Building without the Purchase of Heating/Cooling Equipment

Embry-Riddle Aeronautical University
- Employee Microcomputer Purchase Program

Emporia State University
- Personnel Utilization Study
- Residence Hall Telephone System

Fairleigh Dickinson University, Teaneck/Hackensack Campus
- Joint Use of Parking Facilities with Neighboring Office Buildings to Serve a New Recreational/Athletic Facility

Gardner-Webb College
- Boiler Shutdown to Alternate Hot Water

The George Washington University
- Payment Request Database System
- Surplus Materials Recycling

Georgia Institute of Technology
- Rambler Program

Georgia State University
- Trash Receptacles for Recreation Areas

Glassboro State College
- Guaranteed Savings through Energy Management/Building Operations Services

Grand Valley State College
- Automatic, Reduced-Cost Maintenance Program for Microcomputers
- Computerized Fire Extinguisher Program
- Individual Financial Planning/Tax Deferred Annuity Program
- Installation of Low Pressure Summer Boiler and Electric Centrifugal Chiller

Greater Hartford Community College
- Lighting Photocell Controls

Illinois Valley Community College
- Water Savings by Changing Air-Conditioning Units

Indiana University-Purdue University at Indianapolis
- Personnel Department–Direct Referral of Applicants

Iowa State University
- Electronic Typewriter Repair
- Emergency Response Building Data Manual
- ISU Printing Department's Direct Entry Billing System
- ISU Printing Department's Electronic Document Transmission Program
- Process Debit Vouchers; Not Purchase Orders

Ithaca College
- Campus Lighting Upgrading

Kansas State University
Cooperative Child Care Center in Underused Student Housing
Kent State University
Heat Exchange for Boiler
Lebanon Valley College
Arranged for Schooling of LVC Employee to Perform as Telecommunications Director
Automatic Changeover in Fuel Used as Changes Occur in Outside Air Temperature
Economic and Efficient Maintenance of Word Processors on an Interim Basis
Maharishi International University
A Holistic Approach to Energy Conservation
Mercy College of Detroit
Open Office Systems
Miami University
Doing Your Own Maintenance of Microcomputers and Word Processors
Millersville University of Pennsylvania
Reduction of Advertising Costs
Montgomery County Community College
Campuswide Electrical Cost Saving Program
Mount Holyoke College
Copy Management Program
Disposal of Confidential Records
Nazareth College
Centralization of Student and Faculty Services
Redirection of Physical Plant Operations
Use of Communications Technology
New Mexico State University
Divide and Conquer Mechanical System Retrofit
North Carolina State University
Federal Property Screening Program at the School of Veterinary Medicine
Installation of Digital Typesetting System
Installation of Two-Color Offset Perfector Press
Northern Arizona University
Air Volume Retrofit Project for Academic Buildings
Northwood Institute
Energy-Efficient Administration Building

Old Dominion University
Telephone Service for Residence Hall Live-In Staff
Pacific Lutheran University
Steam Line Intertie
Pennsylvania State University
Conversion of Heating System From Oil to Natural Gas
Expanded Computerized Postage Chargeback System
Job Site Reporting for Technical-Service Employees
Purdue University
Residence Hall Food Cost Savings by Purchase of Bulk Food Products
Rensselaer Polytechnic Institute
CHOICES: A Consortium Approach to Health Care Cost Containment and a More Productive Workforce
New Employee Orientation Program
Rider College
Automatic Teller Machine Improves Cash Flow
"Bronco Temps" Replaces Commercial Temporary Staff Agencies
Motion Sensors Control Classroom Lighting and Energy Cost
Robert Morris College
On-Line Data and Voice Communications Between Buildings/Between Campuses
Saint Joseph's College
Fabrication of Furniture
St. Mary's University
Facility Renovations using Simplified Means and Specifications
Seattle Pacific University
Computer-Aided Design and Drafting System (C.A.D.)
Sheldon Jackson College
Municipal Solid Waste Heating System
Southern Illinois University-Carbondale
Aircraft Lease/Purchase Plan
Employee Cost-Saving Suggestion Program

Southwestern College
Student-Based Microcomputer and Peripheral Equipment Maintenance Program
Spring Hill College
HTM Heat "N" Hot Water System
Land Reclamation Through Bartering
Pad-Mounted Transformers
Phase Monitors
Safety Load-Breaker Automatics (Kyle switches)
State University of New York at Buffalo
Heat Recovery from Chilled Water System
Suffolk University
A University Solution to Heavy Demand for IBM PCs, XTs, and ATs
Technical College of Alamance
Acquisition of Expanded Telephone System
Tennessee Technological University
Boiler Efficiency Improvements Through Self-Assessment
In-House Infrared Electrical Testing
In-House Ornamental Plant Production
Synthetic Metal Repair of Steam Valves
Texas Tech Health Science Center
Reduction in Water Consumption-Central Plant #2
Texas Tech University
Application of Drum Sander to Cabinet Work
Towson State University
Microcomputer Repair Facility
Treasure Valley Community College
New Phone System at TVCC
Trinity College
Energy Conservation by Conversion of Steam to Hot-Water Heating
Tufts University School of Veterinary Medicine
Exchange Carts for Receiving
Internal Mailing Envelope
Milli-Q Pure Water System
Steam Line Conduits
Surplus Equipment Recycling Program
Unification Theological Seminary
Cooperative Telephone System

The University of Alabama
- Coal-Bed Methane Gas Supply System
- Vehicle Conversion to Compressed Natural Gas (CNG)

University of Arizona
- Eliminate Purchase of Collision-Damage Waivers

University of California, Berkeley
- Change Through Marketing: Berkeley's Approach to Telecommunications Development

University of California, San Diego
- Self-Processing and Collection of University Parking Citations

University of Cincinnati
- Student-Developed Management Information Systems

University of Delaware
- Computerization of Utilities Billing and Accounting

University of Florida
- Reduction in Boiler Fuel Expense by Steam Condensate Recovery System

University of Houston-University Park
- Departmental Reorganization and Cross-Training Program
- Elevator Maintenance Shop
- Energy Conservation Project Funding
- Materials Expediter
- Trash Compactor and Disposal Service
- Using Project Coordinators for Construction Planning

University of Illinois at Urbana-Champaign
- Freight Agreement Discount Savings (FADS)

The University of Iowa
- A New Concept in Improving Air Make-Up and Ventilation in a Laundry Facility
- Energy-Reduction Program at the Bowen Science Building
- Fluorescent Relamping Program

University of Iowa Hospitals and Clinics
- Material Services Medical/Surgical Catalog Bid Request (Aggregate and Nonaggregate)

University of Kentucky
- Efficient Electric Chiller Provides Cost-Effective Replacement of Steam Driven Model
- Energy Savings in Control of Computer Room Atmosphere
- Manufacturing Round Welded Duct for Cost Savings

University of Lowell
- Energy Conservation–Lighting Changes

University of Miami
- Annual Chiller Inspection
- Establishment of In-House Review of External Architectural-Engineering Design

University of Missouri-Columbia
- Marketing the Storeroom (General Stores)

University of Nebraska Medical Center
- Retrofit Dual-Duct Air System to Variable-Volume Air System
- Sale of Nursing Uniforms and Lab Coats
- Stockless Purchasing Frees Up Space

University of Oklahoma
- Dormitory Study Desk Renovation
- Steam Boiler Night Shutdown
- Student Remote Payment Center

University of Pennsylvania
- Resale of Administrative Telephone Lines to Students
- Serpentine Service Counter

University of Pittsburgh
- Externally Oriented Training Academy

University of Scranton
- Establishment of a Computer Maintenance Center

University of South Carolina
- Cost Savings through a Combination of Elimination and Innovation

University of South Florida
- Install Heat Exchanger in Condensate Manifold-Absorption Chillers

University of Southern Indiana
- Installation of "Part-Load" Centrifugal Chiller

University of Tennessee at Chattanooga
- Acquisition of Emergency Telephones
- Collection Person
- Establishment of Arena Escrow Checking Account

The University of Tennessee, Knoxville
- Power Factor Improvement

The University of Tennessee, Universitywide Administration
- Short-Term Financing of Equipment with Variable Rate Demand Bond Credit Facility
- University Press Consortium

University of Utah
- Computer System for Budget Preparation and Submittal

University of Virginia
- Automated Lockbox for Parking Ticket Payments
- Maintenance Contract for IBM Personal Computers

University of Washington
- Automated Invoice Receivables Control System
- High School Honor Students for Filing Staff
- Mechanized Edging of Shelves and Countertops

University of Wisconsin-Madison
- Personal Computer-Based Checkwriter

Utah Technical College at Provo/Orem
- Conversion of Constant Volume, Double-Duct System to VAV in Business Building
- Installation of Occupancy-Sensing Light Switches in Business Building

Vanderbilt University
- Prospect Tracking System

Virginia Wesleyan College
- Golf Carts and Radios for Use in Maintenance

Wake Forest University
- Storm Window Fabrication and Installation

Washington State University
- Indirect Cost Automation for Sponsored Projects

Weber State College
- In-House Snow Removal

Wentworth Institute of Technology
- Electrical Control System

Western Carolina University
- Floor-Machine Pad Life-Extension Procedure
- Modified Buffet
- Window Screen Manufacturing and Replacement Program

Western Washington University
Collecting Unpaid Parking Fines
Wheaton College
Major Lighting Cost Reduction in Museum by Special Use of Motion Sensors

---

Southern Methodist University
Computerized Parking Violation Report System
Kansas Newman College
Encapsulation of Asbestos Ceilings
Duke University Medical Center
Vehicle Registration by Mail
Columbia University
Microcomputer and Peripheral Equipment Maintenance Program
Indiana University-Purdue University at Indianapolis
Campus Police Trained by Video Tapes
Iowa State University
Chemical Spill-Control Kits
Texas Tech University
Gas Line Survey Program
University of Pennsylvania
Nuclear Roof Survey
Bethune-Cookman College
Special Roof Repairs to Reduce Cooling Costs
Hampshire College
Small Cogenerators
Harvard University
Swimming Pool Cogeneration
Hofstra University
A New Organizational Model for Dormitory Security
Northern Essex Community College
Housekeeping Operations Program
Tufts University
Trash Compactor for Low-Level Radioactive Waste
University of Iowa
Purchasing Interruptible Electrical Power
University of Nebraska Medical Center
Building Operator Training and Development Program

Vanderbilt University
Staff Computer Literacy
Barnard College
Automated Steam Load-Shedding Control System
Benedict College
Using Paraprofessionals to Establish Records Management Center
Bryn Mawr College
Long-Term Leases for Faculty Housing
Central Michigan University
Costing Labor Contracts with Microcomputers
College Misericordia
New Energy-Saving Steam Traps
Cornell University
Lint Control Device for Dryers
DePaul University
Monitored Purchases of Lower-Cost Fuel for Vehicles
Embry-Riddle Aeronautical University
Venture Capital and Profit-Sharing from Contracted Food Service
Linfield College
Redesigned Gift Receipts
Louisiana State University
Using Student Organizations for Campus Improvement
Michigan State University
Standardized Controls for HVAC System
Mohave Community College District
District Telecommunications Project
Purdue University
Reloading Ribbons in Computer Printer Cartridges
San Diego State University
Liquid Waste Disposal System
Syracuse University
Student Employment Office for Auxiliaries
Texarkana Community College
30+/10 Employment Plan
Texas Tech University Health Sciences Center
Reduction of Primary Chilled-Water Pump Capacity

University of Akron
Post Office Box for Cash Receipts
University of Central Florida
Construction-In-Progress File Information System
University of Dayton
Rebates for Automotive Repair
University of Maryland
911 Emergency Interface System
University of Missouri-Columbia
Bar-Coded Central Mail Processing System
University of Rochester
Heat Pump/Heat Recovery System
University of Southern California
Telecommunications Computerized Management Systems
University of Tennessee
Corporate Travel Card Program
University of Tennessee at Martin
Synthetic Gym Floor Refinishing
University of Washington
Central Stores Rental Equipment Tracking System
West Virginia University
Combination Side/Front Refuse Dumpster
Indiana University-Purdue University at Indianapolis
Computerization of Mail Preparation Charges
Iowa State University
Billing Summary Report
Systems Contracting
Southern Methodist University
Health Program for Faculty and Staff
University of Pennsylvania
Perforated, Six-Tab File Folders
Recorder and Transcriber for Police Records
University of Washington
Automated Purchase-Request System
Vanderbilt University
Computerized Telephone Directory

NACUBO Board of Directors

Joe F. Evans, President, *Washington University*
R. R. Reid, Vice President/President Elect, *Whitman College*
Alvin N. Ward, Secretary, *Drexel University*
Louis Moelchert, Jr., Treasurer, *University of Richmond*
Joe H. Barber, Jr., *Mississippi College*
Charlotte V. Berry, *California State University*
A. Dean Buchanan, *California Lutheran College*
George Davis, Jr., *Montgomery College*
William L. Erickson, *San Diego State University*
John A. Falcone, *Lafayette College*
Robert C. Froelich, *Central University of Iowa*
Peter G. Geil, *Wittenberg University*
Ken J. Kolbet, *College of DuPage*
James E. Morley, *Cornell University*
John D. Mulholland, *Indiana University*
George J. Ruschell, *University of Kentucky*
W. T. Shropshire, *Huston-Tillotson College*
Paula I. Thomas, *University of Southern California*
Fred S. Vorsanger, *University of Arkansas Foundation*

Robert L. Carr, Executive Vice President